CLAIMS

What is claimed is:

1. A method for forming a pocket dopant region of an indium ion, the method comprising:

providing a P-type semiconductor substrate;

forming a dielectric layer on said P-type semiconductor substrate;

forming and defining a photoresister layer on said dielectric layer;

performing a N-type ion-implanting process by way of using said photoresister layer as an ion-implanting mask to form a N-type ion-implanting region in said P-type semiconductor substrate; and

performing a pocketed ion-implantation with an indium ion by way of using said photoresister layer as said ion-implanting mask to form said pocket dopant region of said indium ion closed to beside said N-type ion-implanting region.

2. The method according to claim 1, wherein said dielectric layer comprises a stack dielectric layer.

3. The method according to claim 2, wherein said stack dielectric layer comprises a oxide-nitride-oxide layer.

4. The method according to claim 1, wherein the method for forming said dielectric layer comprises a depositing process.

5. The method according to claim 1, wherein said N-type ion-implanting region comprises a source/drain region.

6. A method for forming a read only memory, the method comprising:

providing a P-type semiconductor substrate;

forming a dielectric layer on said P-type semiconductor substrate;

forming and defining a plurality of photoresister layers on said dielectric layer to expose a portion of said dielectric layer;

performing a pocketed ion-implantation with an indium ion at least one time by way of using said plurality of photoresister layers as a plurality of ion-implanting masks to form a plurality of pocket dopant regions having said indium ion in said P-type semiconductor substrate; and

performing a N-type ion-implanting process by way of using said plurality of photoresister layers as said ion-implanting masks to form a plurality of N-type ion-implanting regions in said P-type semiconductor substrate between said plurality of photoresist layers; and

removing said plurality of photoresist layers to form said read only memory.

7. The method according to claim 6, wherein said dielectric layer comprises an nitride layer.

8. The method according to claim 6, wherein the method for forming said dielectric layer comprises a depositing process.

9. The method according to claim 6, wherein said plurality of pocket dopant regions having said indium ion are located in said P-type semiconductor substrate beside said plurality of N-type ion-implanting regions.

10. The method according to claim 6, wherein said plurality of N-type ion-implanting regions comprises a plurality of source/drain regions.

11. A method for forming a read only memory, the method comprising:

providing a P-type semiconductor substrate;

forming a dielectric layer on said P-type semiconductor substrate;

forming and defining a plurality of photoresister layers on said dielectric layer to expose a portion of said dielectric layer;

performing an etching process by way of using said plurality of photoresister layers as a plurality of etching masks to etch said dielectric layer and form a plurality of memory cells;

performing a pocketed ion-implantation with an indium ion at least two time by way of using said plurality of photoresister layers as a plurality of ion-implanting masks to form a plurality of pocket dopant regions having said indium ion beside said P-type semiconductor substrate under said plurality of memory cells; and

performing a N-type ion-implanting process by way of using said plurality of photoresister layers as said ion-implanting masks to form a plurality of N-type ion-implanting regions in said P-type semiconductor substrate between said plurality of memory cells; and

removing said plurality of photoresist layers to form said read only memory.

12. The method according to claim 11, wherein said dielectric layer comprises an nitride layer.

13. The method according to claim 11, wherein the method for forming said dielectric layer comprises a depositing process.

14. The method according to claim 11, wherein said plurality of pocket dopant regions having said indium ion are located in said P-type semiconductor substrate beside said plurality of N-type ion-implanting regions.

15. The method according to claim 11, wherein said plurality of N-type ion-implanting regions comprises a plurality of source/drain regions.

16. A method for forming an nitride read only memory, the method comprising:

providing a P-type semiconductor substrate;

forming an oxide-nitride-oxide layer on said P-type semiconductor substrate;

forming and defining a plurality of photoresister layers on said oxide-nitride-oxide layer to expose a portion of said oxide-nitride-oxide layer;

performing an etching process by way of using said plurality of photoresister layers as a plurality of etching masks to etch said oxide-nitride-oxide layer and form a plurality of read only memory cells;

performing a N-type ion-implanting process by way of using said plurality of photoresister layers as an ion-implanting masks to form a plurality of N-type ion-implanting regions in said P-type semiconductor substrate between said plurality of read only memory cells;

performing a pocketed ion-implantation with an indium ion at least two time by way of using said plurality of photoresister layers as said plurality of ion-implanting masks to form a plurality of pocket dopant regions having said indium ion beside said P-type semiconductor substrate under said plurality of memory cells; and

removing said plurality of photoresist layers to form said nitride read only memory.

17. The method according to claim 16, wherein the method for forming said oxide-nitride-oxide layer comprises a depositing process.

18. The method according to claim 16, wherein said plurality of N-type ion-implanting regions are separated by a channel from each other.

19. The method according to claim 16, wherein said plurality of N-type ion-implanting regions comprises a plurality of source/drain regions.

20. The method according to claim 16, wherein said plurality of pocket dopant regions having said indium ion are located in said P-type semiconductor substrate beside said plurality of N-type ion-implanting regions.